

## Ostali članci / Other topics:

GRAND CAYMAN ENVIRONMENTAL HISTORY: A CASE STUDY OF THE ANTHROPOCENE<sup>1</sup>

## POVIJEST OKOLIŠA OTOKA GRAND CAYMAN: STUDIJA SLUČAJA ANTROPOCENA

J. Donald HUGHES

Professor Emeritus,  
University of Denver  
J.Hughes@du.edu

Received / Primljeno: 21. 7. 2017.

Accepted / Prihvaćeno: 12. 12. 2017.

Original scientific paper / Izvorni znanstveni rad

UDK / UDC: 502.1 (261.55)

502.14(729.291)

## Sažetak

*Antropocen je zasnovan na premisi da su ljudska djelovanja tako snažne sile u preobrazbi i kontroli ostatka prirode da ostavljaju tragove u prirodnom okruženju, koji će se zadržati u budućim stoljećima. Time je antropocen ušao kao termin za označavanje nove epohe u geološkoj i ekološkoj povijesti. Međutim, postoje suprotstavljene teorije o tome kada je antropocen započeo, a uvelike je prihvaćena teorija »Velikog ubrzanja« zbog mnogih čimbenika nakon Drugog svjetskog rata. Kao studija slučaja, uzet je primjer relativno izoliranog karipskog otoka Grand Cayman, koji omogućava znanstvenicima da vide transformacije koje su brze i mogu se pratiti sve do određenih uzorka tih transformacija. U početku je otok bio nenaseljen, pa je temeljno polazište da je otok bio u prirodnom stanju sve do dolaska prvih naseljenika u sedamnaestom stoljeću. Šezdesetih godina prošlog stoljeća, nakon razdvajanja od Jamajke, doneseno je zakonodavstvo kojim se ukida oporezivanje tvrtki, čime je Kajmansko otočje postalo značajna porezna oaza i time je potaknut gospodarski rast. Kapitalizam i svjetsko tržišno gospodarstvo odigrali su veliku ulogu u rastu populacije i velike kontrole prirode na otoku Grand Cayman. Stanovništvo se brzo povećalo, a turizam postao vodeći oblik razvoja. Antropocen ipak ne znači ukupnu ljudsku kontrolu prirode. Uragani, potresi i porast razine mora su realne prijetnje otoku Grand Cayman. Brojne su endemske biljke i životinje koje su se razvile na otoku, no veliki postotak tih vrsta, pa čak i cijeli ekosustavi, sada su ugroženi i pred izumiranjem zbog ljudskih aktivnosti, uključujući i dovođenje novih agresivnih vrsta. Poduzeti su programi zaštite i obnavljanja autohtonih vrsta kao što su morske kornjače i plave iguane, te određena posebna zaštićena područja. Mjere za borbu protiv komaraca su uspjele. Budućnost otoka Grand Caymana s kontinuiranim kapitalističkim razvojem mogla bi od otoka napraviti karipski Hong Kong u malom, no i priroda bi tu mogla intervenirati.*

**Ključne riječi:** antropocen, kapitalizam, Karibi, povijest okoliša, izumiranje, otok Grand Kajman, Veliko ubrzanje, morske kornjače.

**Keywords:** Anthropocene, capitalism, Caribbean, environmental history, extinction, Grand Cayman Island, Great Acceleration, sea turtles.

<sup>1</sup> I thank Ann Stafford, Margaret E. Leshikar-Denton of the Cayman National Museum, the staff of the Queen Elizabeth II Botanic Park, the Sunshine Suites desk staff, the University of Denver, and Pamela L. Hughes for irreplaceable help in my research on Grand Cayman Island.

## INTRODUCTION

A prominent buzzword these days in environmental history, geology, and anthropology is the term »Anthropocene,« the idea that human actions have become such a powerful force in the transformation and control of the rest of nature as to leave traces in the natural environment that will persist into future ages. The term, proposed by Paul J. Crutzen and E. F. Stoermer<sup>2</sup>, has received recognition from official committees that have examined evidence for it. It is a useful concept, but there is different emphasis concerning its definition between historians and scientists. Geologists look for durable evidence in detectable strata, while historians are interested in the degree to which humans are responsible for lasting changes in the landscape. There is also disagreement about when the Anthropocene began. Humans have had effects on the environment at least since the invention of agriculture, and probably earlier. But in the context of world history, human numbers, the extent of modification of the environment, and the speed with which nature became subject to human domination took an astounding upturn after the end of the Second World War. J. R. McNeill and Peter Engelke named this the »Great Acceleration.«<sup>3</sup> I treat this as the onset of the Anthropocene. Interestingly, the recommendation of the Working Group on the Anthropocene (WGA) to the International Geological Congress (August 2016) chose near 1950 as the epoch's onset.<sup>4</sup>

Many trends have risen into public consciousness since then that received little or no notice previously. Global climate change, depletion of the ozone layer, accumulation of carbon dioxide in the atmosphere, oceanic pollution by floating debris, a sharp increase in the number of invasive species and species made extinct, and rapid deforestation in the tropics are a few examples, unfortunately among many others.

When looking for a case study, I reflected that the scale of a small island allows changes to be observed over a shorter time span and within a limited area. Grand Cayman Island is just such a small and relatively isolated place, whose size consequently allows historians to see transformations that are rapid and can be traced to specific causes.<sup>5</sup> In Grand Cayman Island human intervention is recent and can be documented and there have been illustrative human-caused changes in the biota, land and sea, offering an unusual opportunity to observe the advent of the Anthropocene in its extent and speed. Economic isolation is important in delaying aspects of the Anthropocene, but economic policy on Grand Cayman Island has countered that factor.<sup>6</sup>

Grand Cayman Island is located at 19 degrees north latitude in the northern Caribbean Sea, about 336 km (227 mi) south of Cuba and 500 km (310 mi) west of Jamaica. Its area is nearly 200 km<sup>2</sup> (76 sq. mi.) With two much smaller islands, it forms a British Overseas Territory having a population near 60,000. The climate is tropical, with an average temperature of 25-30 degrees C (75-86 degrees F). Annual rainfall is between 1,100 and 1,600 mm (43 to 63 in.), drier in the east and moister toward the west, with two seasons: wet in summer and dry in winter.

<sup>2</sup> Paul J. Crutzen and Eugene F. Stoermer, »The 'Anthropocene,'« *IGBP* (International Geosphere-Biosphere Programme) *Newsletter* 41 (2000): 16-18.

<sup>3</sup> J. R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene since 1945*. Cambridge, MA: The Belknap Press of Harvard University Press, 2014.

<sup>4</sup> Damian Carrington, »The Anthropocene Epoch: Scientists Declare Dawn of Human-Influenced Age,« *The Guardian*, 29 August 2016

<sup>5</sup> I met with Ann Stafford, a leading naturalist in the Caymans with an encyclopedic knowledge of the local plants. She helped me to make research contacts and took me to observe the vegetation and other aspects of the environment in some of the less visited parts of the island under her guidance. Her website, including photographs of plants and animals, is caymannature.ky

<sup>6</sup> Matthew R. Helmus, D. Luke Mahler and Jonathan B. Losos, »Island Biogeography of the Anthropocene,« *Nature* 513 (25 September 2014): 543-547.

## THE PERIOD BEFORE SETTLEMENT

Christopher Columbus sighted the islands in 1503 on his fourth voyage to the Indies and named them »Las Tortugas« (»The Turtles«) because he noted great numbers of sea turtles in the surrounding waters. There were no human inhabitants, and archaeologists have not found any sites to indicate that aboriginal people ever lived there, although they have searched systematically.<sup>7</sup> This establishes a baseline, namely that the island was in an almost purely natural state until permanent residents came in the mid-seventeenth century. People from other Caribbean lands may have come on boats to catch turtles, and may have landed briefly. Sailors provided themselves with meat by keeping turtles on board trussed upside down and alive until needed. Consequently, numbers were depleted. By 1830, they were rare near Grand Cayman Island and turtles ranged further to Cuba and then Central America. The name »Cayman« refers to crocodiles that flourished on the island until the 20<sup>th</sup> century. Sir Francis Drake, the first English visitor (1585), wrote that they were edible.

Crews of ships that landed found little water, which made the island less desirable as a recharging stop. There are no rivers on Grand Cayman Island due to drainage through the limestone karst of coral origin that covers most of the land, but here are lenses of fresh to mildly brackish water that make a few wells possible. The vegetation before human settlement consisted of thriving forests, dry shrublands, seasonally flooded woodlands, and large areas of mangroves. Due to its isolation, many endemic plants evolved on Grand Cayman Island, but a large percentage of these species, and indeed whole plant communities, along with the animals that inhabit them, are now threatened with extinction.<sup>8</sup>

## EARLY HISTORY

English soldiers from Admiral Sir William Penn's navy that conquered Jamaica<sup>9</sup> were the first permanent settlers. After hostility and raids on both sides, Spain recognized English possession of Jamaica including the Caymans in a 1670 treaty. Other arrivals followed, including Protestants fleeing from Spanish rule and shipwrecked sailors. Pirates used the island as a hangout in the early 1700s.<sup>10</sup> As the economy developed, landowners wanted slaves in the timber, cotton, phosphate, coconut, and rope industries, and the slave society grew from about 1730, to outnumber the free population, until the British government in 1833 outlawed slavery. Now the majority of Caymanians are of mixed African and English descent. The total human population increased from less than 1,000 in 1802 to 6,000 just before the Second World War. In that period the local environment suffered disastrous reduction of the turtle population, habitat destruction, and extinction of many native animals and plants.<sup>11</sup> Timber production passed turtles as the most valuable export in the eighteenth century, while shipbuilding and other construction demanded trees, so that forest composition changed as desired species such as mahogany, ironwood and dye trees were felled for domestic use and export.<sup>12</sup> The logwood tree, introduced as a source of dye, has crowded into seasonally flooded areas. Another aggressive non-native tree, the Australian casuarina, which can force out native vegetation, is troublesome especially in sandy coastal areas.

<sup>7</sup> Anne V. Stokes and William F. Keegan, »A Reconnaissance for Prehistoric Archaeological Sites on Grand Cayman,« *Caribbean Journal of Science* 32.4 (1996): 425-450.

<sup>8</sup> Frederic J. Burton, *Threatened Plants of the Cayman Islands: The Red List*. Richmond, Surrey: Kew Publishing, Royal Botanic Gardens, Kew, 2008.

<sup>9</sup> Penn first attempted unsuccessfully to conquer Hispaniola, so Jamaica was a consolation prize. The Cayman Islands were treated as part of Jamaica until 1962. Penn was serving the government of Oliver Cromwell, but was in fact a royalist. Admiral Sir William Penn was the father of the Quaker William Penn who founded Pennsylvania.

<sup>10</sup> Michael Craton and the New History Committee, *Founded upon the Seas: A History of the Cayman Islands and Their People*. Kingston: Ian Randle Publishers, 2003, 20-27.

<sup>11</sup> Craton, *Founded Upon the Seas*, 39.

<sup>12</sup> Craton, *Founded Upon the Seas*, 39.

An example of extinction is the Grand Cayman thrush, found on the island in swampy locales and mangrove forests, a relative of the American robin but different in coloration.<sup>13</sup> First observed in 1886, it interested bird collectors, scientists and museums, who caught as many as they could until it disappeared as the result of their efforts and also from loss of habitat. Someone saw the last individual in 1938. It appears on some of the Cayman Islands stamps, whose sales to philatelists offered income to the government. Perhaps it was a species that was »loved« to death. The Oxford University Expedition made the first natural history survey of the islands also in 1938, which gives us a picture of the state of nature before the Anthropocene began in earnest.

Change accelerated with the Second World War. A US Navy and Coast Guard base existed from 1942 to 1945, and a civilian airfield was constructed in 1953, encouraging the growth of tourism, and tourists required hotels. Multinational companies built them, particularly along the attractive Seven Mile Beach on the west coast. Native ecosystems lost ground to this growth and to the expansion of the capital, George Town. A main limitation on tourism was the presence of hungry clouds of mosquitoes. The pre-settlement island had none of these insects, but visiting ships discharging used water tanks inadvertently released huge numbers of mosquito larvae with the result that there are 36 species known today. Virtually every known method of control has been used, each of which has unintended environmental effects. Oil spread on water harms marine life, birds and cattle; spraying kills non-target species.

## ENTER CAPITALISM

Up to the late 1960s, Grand Cayman might justifiably be said to be in the period of incremental growth that characterized the Holocene, the period before the Anthropocene. A chapter entitled »The Latest Age« in an official history of the Cayman Islands published in 1970 clearly demonstrates conditions at the time.<sup>14</sup> But rapid and extensive spread of human domination was about to appear.

In 1962 Jamaica gained independence from the United Kingdom, but the Caymans chose to remain a British dependency, a status that remains in 2017. Legislation encouraging business by exemption from taxes was enacted in 1966, making the Cayman Islands one of the most well known tax havens in the world. It does not have a corporate tax, making it a magnet for multinational corporations who create subsidiary entities to shield some or all of their incomes. The Caymans attracted financial activity because they were a safe, well-administered polity, relatively free of crime, and could guarantee confidentiality, low costs, freedom of regulation, and capable corporate attorneys.<sup>15</sup> As Colin Powell observed in 2003:

*Money is a coward. It flees from corruption and bad policies, conflict and unpredictability. It shuns ignorance, disease and illiteracy. Money goes where it is welcomed and where investors can be confident of a return on the resources they have put at risk.*<sup>16</sup>

A better method to attract banks and capital can hardly be imagined, and it succeeded in making the Caymans the fifth most important tax shelter in the world for years. Around 2000, practices perhaps too friendly to sheltered businesses had to be revised to meet international standards, and the boom slowed but did not cease.

Rapid growth of all kinds had flourished from the 1970s to the 1990s.<sup>17</sup> The population in 1966 was 8.4 thousand; by 2006 it had grown to 52.2 thousand. At the same time businesses proliferated to the extent that there are more businesses than people. This makes the Caymans a prime example for the contention that capitalism is a driving force behind the Anthropocene, an idea that has led several

<sup>13</sup> BirdLife International. 2016. *Turdus ravidus*. The IUCN Red List of Threatened Species 2016: e.T22708835A94180077.

<sup>14</sup> Neville Williams, *A History of the Cayman Islands*. Grand Cayman: The Government of the Cayman Islands, 1970 (Reprinted 1992, 1995), Chapter IV, well portrays the state of the islands as it was just at the start of the »great acceleration.«

<sup>15</sup> J.A. Roy Bodden, *The Cayman Islands in Transition: The Politics, History, and Sociology of a Changing Society*. Kingston: Ian Randle Publishers, 2007.

<sup>16</sup> Quoted in Bodden, *The Cayman Islands in Transition*, 146.

<sup>17</sup> Neville Williams, *A History of the Cayman Islands*. Grand Cayman: The Government of the Cayman Islands, 1970 (Reprinted 1992, 1995) well portrays the state of the islands as it was just at the start of the »great acceleration.«

scholars, notably Andreas Malm, Donna Haraway, and Jason W. Moore, to propose that the new age be designated the »Capitalocene.«<sup>18</sup>

The results of capital development include urbanization and many effects of infrastructure and transportation that transform the habitats of animals and plants, causing deforestation and loss of wetlands. It introduced disruptive species such as the agouti, green iguana, and invasive plants. Funds became available for construction of offices and business establishments, hotels, restaurants, homes and infrastructure such as roads, water supply and sewage systems, petrol stations, and all the other intrusive necessities of urban life. According to Michael Craton,

*From their earliest beginnings, Caymanians had been shaped by their environment. The sea and the land had, in many ways, defined them. Yet from the start they had also worked to shape their physical environment: first with machete and mattock, now, 300 years later, with bulldozer and backhoe.*<sup>19</sup>

In a series of decades the character of exports has changed. Turtle, shark leather, sponges, logwood, red mangrove bark, coconuts, guano, cotton, and rope made out of the indigenous Silver Thatch Palm formerly dominated the economic history of Grand Cayman Island. At present these exports represent only a small fraction of the total, but a thriving financial services and tourism-based economy has taken root in George Town and the port and cruise ship landing areas are busy crowded centers.

Population grew rapidly; in 2000 it was 40,000, and is now around 60,000. More facilities were required; for example the water supply on the island is totally inadequate for the use demanded. The solution was to make seawater drinkable through plants using reverse osmosis, and this method now supplies all the water in piped systems.<sup>20</sup> The energy for this conversion remains fully dependent on diesel fuel for generation despite continued efforts to employ renewable sources. The expansion of facilities takes up land, and in this small island it is projected that in decades the only undeveloped land will be in areas that are rigorously protected. A few such reserves have been created, but in an example of ongoing development, in relatively undisturbed forest a plot of land on a street with the ironic name »Quiet Way« is being developed within a hundred yards of the spot where a rare species of flowering plant was discovered.

## NATURAL CATASTROPHES

The model of the Anthropocene as a progressive establishment of human control over nature is misleading in an important way. Nature does not in every instance passively submit to the yoke, but is an active force that can dwarf the scale of technology's achievements.<sup>21</sup> In the case of Grand Cayman Island, this natural power is exhibited in the hurricanes that sweep over or nearby, with ravaging winds, torrential rain, and flooding on land and from the sea. Among the most notable of these were the hurricanes of 1903 and 1932, Gilbert in 1988, Ivan with winds at 265 kph the most destructive in recent memory in 2004, and Paloma in 2008. Structures were destroyed, forests almost leveled, and reefs badly damaged.

Earthquakes are common, since the Cayman Islands sit on the Cayman Rise, the north margin of the Cayman Trough, where the Caribbean Tectonic Plate meets the North American Plate.<sup>22</sup> An earthquake of 6.8 magnitude, the strongest in a century, hit Grand Cayman Island in 2004 not long after the hurricane.

<sup>18</sup> Andreas Malm, »The Origins of Fossil Capital,« *Historical Materialism* 21.1 (2013): 15-68; Donna Haraway, »Anthropocene, Capitalocene, Plantationocene, Chthulucene,« *Environmental Humanities* 6.1 (2015): 159-165; Jason W. Moore, ed., *Anthropocene or Capitalocene?: Nature, History, and the Crisis of Capitalism*. Oakland, CA: PM Press, 2016.

<sup>19</sup> Craton, *Founded Upon the Seas*, 401.

<sup>20</sup> By 2008, piped water was available to nearly all residents of Grand Cayman, either via the Water Authority's water distribution system, or via the (much smaller) water distribution system owned by Cayman Water Company, a private company operating under a license from the Government. Close to 100% of the island is hooked up to the system.

<sup>21</sup> Carolyn Merchant, *Autonomous Nature: Problems of Prediction and Control from Ancient Times to the Scientific Revolution*. New York: Routledge, 2016, esp. pp. 1-14.

<sup>22</sup> CCRIF (The Caribbean Catastrophe Risk Insurance Facility), *The Cayman Islands: Country Risk Profile*. George Town: CCRIF, August 2013.

Worldwide sea level is expected to rise due to warming climate and melting ice. Grand Cayman Island will be particularly vulnerable to rising sea level, since it is flat, lacking high elevations.<sup>23</sup> A rise of one meter would inundate 10 percent of the built-up area, and 2 m would affect 50 percent.

## ENVIRONMENTAL RECOVERY

Measures to repair damage to the environment are another dimension of human control of nature, and their appearance is therefore part of the Anthropocene. They require financial support, and to succeed need economic justification. Giglioli and Davis demonstrate their awareness of this need:

Population, construction, land development, tin can economy all eventually led to environmental deterioration and incipient pollution: more and more the need for reasoned controls and nature management became obvious to the biologist, but first it was necessary to educate by quantified evidence the few, and later the many, to the simple fact that conservation in a small island environment is sound economics.<sup>24</sup>

The educational effort is forwarded by the Cayman Islands National Museum in George Town, founded in 1979, where well-designed exhibits include a Natural History Gallery that explains the ecosystems of the islands and shows the need for conservation of species and habitats.

Attempts to restore the numbers of endangered species became profitable only when linked to tourism. A Green Turtle Farm designed to encourage reproduction and sell turtle meat lost money under successive owners; a turtle canning business lasted only five years. Subsequently the government bought the business, improved the facilities, and turned it into a popular attraction. Many turtles are released into the wild to restore numbers, more than 30,000 to date, and others are sold to restaurants to make money for the project. Turtles and their products cannot be exported legally, so the Cayman Islands are the only place in the world where turtle meat can be eaten lawfully and, one hopes, without guilt.<sup>25</sup>

There is also a recovery program for blue iguanas, an endangered species that is endemic only to Grand Cayman Island, at the Queen Elizabeth II Royal Botanic Park.<sup>26</sup> This park, opened by the Queen during her 1993 visit, also includes conservation projects for endemic plants, a strictly protected nature preserve, and gardens containing both native and introduced plants. An artificial lake provides refuge for water birds such as purple gallinules and whistling ducks. The blue iguana was formerly widespread across the island, notably in forested sections, but later the settlers hunted them to prevent damage to their gardens and packs of dogs killed them. Common green iguanas were unfortunately introduced, and their high rate of reproduction as well as their fear of predators allowed them to outcompete the blues, who had evolved in a predator-free environment. A few of the surviving wild blue iguanas were captured and placed in safe facilities where they were cared for and could reproduce.<sup>27</sup> Eventually the some of the offspring were released in hopes of establishing a viable population.

Efforts to make the environment pleasant for people continued. In 2016 a program began to release millions of sterile male mosquitoes. Studies show a reduction of 90 percent in total numbers in western Grand Cayman from all methods. As insect numbers fell, bats and birds could catch fewer of their major food source. Malaria and yellow fever are absent, and zika has produced very few cases, although bite prevention measures are advised.

<sup>23</sup> Murray C. Simpson, Nicholas B. Robson, and David Smith, *Sea Level Rise and Its Impact on the Cayman Islands*. The Cayman Institute for the Government of the Cayman Islands and the British Foreign and Commonwealth Office, May 2009.

<sup>24</sup> M.E.C. Giglioli and J.E. Davies, »The Boom Years in Grand Cayman: Environmental Deterioration and Conservation.« In *The Cayman Islands: Natural History and Biogeography*, edited by M.A. Brunt and J.E. Davies. Dordrecht: Springer Science+Business Media, 1994, 509-526, quote on p. 511.

<sup>25</sup> This author tried a »turtle burger« and found it lacking in taste.

<sup>26</sup> David Martins and Andrew Guthrie, *Queen Elizabeth II Botanic Park: One With Nature*. Virginia Beach, VA: Donning Company Publishers, 2002.

<sup>27</sup> Frederic J. Burton, *The Little Blue Book: A Short History of the Grand Cayman Blue Iguana*. San Jose, CA: International Reptile Conservation Foundation, 2010.

## UNDERWATER EFFECTS

The Anthropocene and capitalism have also extended their effects to adjoining waters. Marine communities have been transformed by dredging, draining, canal development by dragline, and other construction activities, particularly in the North Sound, producing increasing turbidity that has spread widely.<sup>28</sup> Sunken ships, trapped by the reefs through history, number near 140. The most famous event is the 1794 »Wreck of Ten Sail«, in which the frigate HMS *Convert* and nine merchant ships of her convoy sank near the East End of Grand Cayman Island. Wrecks offered places for coral growth and fish, and some are dive sites. The National Museum joined with other agencies in 2002 to create the Maritime Heritage Trail, protecting shipwreck preserves of great interest, among which the first is the accessible site of the 1913 wreck of the Scottish-Norwegian barque *Glamis*.<sup>29</sup> The USS Kittiwake, a Chanticleer-class rescue vessel, was deliberately sunk in 2011 to serve as an artificial reef, and is now a popular dive site. Underwater ecosystems are also visible by submarine, allowing passengers to take note of the coral reefs and various forms of sea life. Biodiversity is quite high, in waters around Grand Cayman Island, but invasive species such as the lionfish are troublesome. Rising water temperatures, hurricanes, diving activities, and anchors of the numerous cruise ships that bring the majority of tourists to George Town cause injury to the reefs.

## CONCLUSION

The advent of the Anthropocene with a »Great Acceleration« in the period 1966-2000 can be identified in Grand Cayman Island history. The progression of human domination of Grand Cayman Island to the point of total control of the physical and biotic conditions of the landscape seems inevitable, and not far in the future. Most aspects of this control were made possible by the accumulation of capital associated with the decision to make the Cayman Islands one of the world's most important business tax shelters. »Capitalocene« may be a clumsy term, and will not replace »Anthropocene,« but it does represent an important aspect of environmental history. Capital in Grand Cayman Island is an engine of growth giving energy to urban expansion, tourism, and the use of resources. Without it the support for and adoption of conservation measures would suffer, since these measures require financial support and tourist attraction. *The Cayman Islands National Strategic Plan* expresses the following hope:

*We believe... That a healthy natural and built environment and a balance between the two, is essential for social, economic and political well-being and prosperity.*<sup>30</sup>

That would be a positive result, but it remains to be seen whether contradictions within capitalism may make it impossible. That is, that capitalism has an inescapable tendency to use up resources until they collapse.<sup>31</sup> In such a case, before the end, Grand Cayman Island in the Anthropocene might come to resemble Singapore or Hong Kong in terms of human structures covering most of the land, if nature does not intervene.

<sup>28</sup> M.E.C. Giglioli and J.E. Davies, »The Boom Years in Grand Cayman,« pp. 516-519.

<sup>29</sup> Margaret E. Leshikar-Denton and Della L. Scott-Ireton, »The Cayman Islands' Experience: Yesterday, Today, and Tomorrow.« In *Underwater and Maritime Archaeology in Latin America and the Caribbean*, edited by Margaret E. Leshikar-Denton and Pilar Luna Erreguerena. Walnut Creek, CA: Left Coast Press, 2008, 221-244.

<sup>30</sup> *Vision 2008: The Cayman Islands National Strategic Plan*, 1998, p. 4, quoted in Craton, *Founded Upon the Seas*, 417.

<sup>31</sup> James O'Connor, »The Second Contradiction of Capitalism: Causes and Consequences,« *Conference Papers*. Santa Cruz, CA: CES/CNS Pamphlet 1, 1991; Ian Angus, *Facing the Anthropocene: Fossil Capitalism and the Crisis of the Earth System*. New York: Monthly Review Press, 2016

**SUMMARY**

The Anthropocene is the idea that human actions have become such a powerful force in the transformation and control of the rest of nature as to leave traces in the natural environment that will persist into future ages, justifying the designation of a new epoch in geological and environmental history. Among conflicting theories as to when the Anthropocene began, important support exists for the »Great Acceleration« of many factors after the Second World War. As a case study, the small and relatively isolated Grand Cayman Island allows scholars to see transformations that are rapid and can be traced to specific causes. There were no native human inhabitants, establishing a baseline in that the island was in a natural state until residents came in the seventeenth century. In the 1960s, after separation from Jamaica, legislation exempting business from taxes was enacted, making the Caymans a notable tax haven and encouraging economic growth. Capitalism and the world market economy played a major role in establishing human formation and control of nature in Grand Cayman Island. Population increased rapidly and tourism became a leading form of development. The Anthropocene does not mean total human control of nature. Hurricanes, earthquakes, and rising sea level are realistic threats to Grand Cayman Island. A number of endemic plants and animals evolved on the island, but a large percentage of these species, and indeed ecosystems, are now threatened with extinction due to human activities including introduction of aggressive species. Programs have been undertaken to protect and restore native species such as sea turtles and the blue iguana, and to designate protected areas. Measures to combat mosquitoes have succeeded. The future of Grand Cayman Island with continued capitalistic development could make it a Caribbean Hong Kong, but nature could intervene.



# *Ekonomska i ekohistorija* *Economic- and Ecohistory*

Časopis za gospodarsku povijest i povijest okoliša

Journal for Economic History and Environmental History

---

Tema broja / Topic

**Iz povijesti okoliša rijeke Drave**  
*From the Drava River's Environmental History*

Volumen XIII / Broj 13  
Zagreb - Samobor 2017  
ISSN 1845-5867  
UDK 33 + 9 + 504.3

**Nakladnici / Publishers:**

Društvo za hrvatsku ekonomsku povijest i ekohistoriju  
*Society for Croatian Economic History and Environmental History*  
Ivana Lučića 3, HR - 10000 Zagreb  
tel.: +385/1/4092-148, fax: +385/1/4092-879  
sites.google.com/site/ekoekohist/

Izdavačka kuća Meridijani  
p.p. 132, 10430 Samobor  
tel.: 01/33-62-367, faks: 01/33-60-321  
e-mail: meridijani@meridijani.com  
www.meridijani.com

**Glavni i odgovorni urednik / Editor-in-chief:**

Hrvoje Petrić

**Uredništvo / Editorial Staff:**

Dragutin Feletar, Željko Holjevac, Mira Kolar-Dimitrijević, Dubravka Mlinarić, Nenad Moačanin,  
Hrvoje Petrić, Drago Roksandić, Mirela Slukan Altić, Ivica Šute

**Međunarodno uredničko vijeće / International Editorial Board:**

Drago Roksandić - president/predsjednik (Zagreb), Daniel Barić (Le Havre-Pariz, Francuska), Slaven Bertoša (Pula), Zrinka Blažević (Zagreb), Tatjana Buklijaš (Auckland, New Zealand), Ljiljana Dobrovšak (Zagreb), Goran Đurđević (Požega), Josip Faričić (Zadar), Borna Fürst Bjeliš (Zagreb), Boris Golec (Ljubljana, Slovenija), Hrvoje Gračanin (Zagreb), Paul Hirt (Tempe, SAD), Andrej Hozjan (Maribor, Slovenija), Egidio Ivetic (Padova, Italija), Silvije Jerčinović (Križevci), Karl Kaser (Graz, Austrija), Isao Koshimura (Tokio, Japan), Marino Manin (Zagreb), Christof Mauch (München, Njemačka), Kristina Milković (Zagreb), Ivan Mirnik (Zagreb), Mirjana Morosini Dominick (Washington D.C., SAD), Géza Pálffy (Budimpešta, Mađarska), Daniel Patafta (Zagreb), Hrvoje Petrić (Zagreb), Lajos Rácz (Szeged, Mađarska), Gordan Ravančić (Zagreb), Marko Šarić (Zagreb), Mladen Tomorad (Zagreb), Jaroslav Vencalek (Ostrava, Češka), Milan Vrbanus (Slavonski Brod, Zagreb), Frank Zelko (Burlington, VT, SAD), Zlata Živaković Kerže (Osijek), Ivana Žebec Šilj (Zagreb)

**UDK oznake članaka / Article's UDC markups:**

Ivica Zvonar

**Prijelom / Layout:**

Saša Bogadi

**Za nakladnike / Journal directors:**

Petra Somek, Hrvoje Petrić

ISSN 1849-0190 (Online)

ISSN 1845-5867 (Tisak)

**Tisak / Print by:**

Bogadigrafika, Koprivnica 2017.

**Adresa uredništva / Mailing addresses:**

Hrvoje Petrić (editor/urednik)  
Odsjek za povijest, Filozofski fakultet  
Ivana Lučića 3, HR-10000 Zagreb  
e-mail: hrvoje.petric@ffzg.hr  
ili Vinka Vošickog 5, HR-48000 Koprivnica

**Tiskano uz potporu Ministarstva znanosti i obrazovanja RH**

**Print supported by Ministry of science and education of Republic of Croatia**

**Na naslovnici / Cover:**

Veduta Ptuja, foto Nataša Kolar

Ekonomsku i ekohistoriju referiraju:

CAB Abstracts  
HISTORICAL ABSTRACTS, ABC CLIO Library, Santa Barbara, California, USA  
AMERICA: HISTORY AND LIFE, Washington, USA  
JOURNAL OF ECONOMIC LITERATURE (JEL), Pittsburgh, USA  
CENTRAL AND EASTERN ONLINE LIBRARY, Frankfurt am Main, Deutschland  
ECONLIT - AMERICAN ECONOMIC ASSOCIATION, Nashville, USA



Društvo za hrvatsku  
ekonomsku povijest  
i ekohistoriju

 Meridijani  
IZDAVAČKA KUĆA

Izdano u Hrvatskoj